
**Larson AFB Titan Missile Facility S-3
Preliminary Assessment Report
Royal City, Washington
TDD: 06-01-0023**

Contract: EP-S7-06-02
August 2006

Region 10
START-3

Superfund Technical Assessment and Response Team

Submitted To: Joanne LaBaw, Task Monitor
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

USEPA SF



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**LARSON AFB TITAN MISSILE FACILITY S-3
PRELIMINARY ASSESSMENT REPORT
ROYAL CITY, WASHINGTON**

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ACRONYM LIST

<u>Acronym</u>	<u>Definition</u>
AFB	Air Force Base
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfs	cubic feet per second
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
E & E	Ecology and Environment, Inc.
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
FUDS	Formerly Used Defense Sites
GSA	General Services Administration
ICBM	intercontinental ballistic missile
MTCA	Model Toxics Control Act
PA	Preliminary Assessment
PCBs	polychlorinated biphenyls
PPE	probable point of entry
START	Superfund Technical Assessment Response Team
TDL	target distance limit
USACE	United States Army Corps of Engineers
UST	underground storage tank

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**LARSON AIR FORCE BASE (AFB) TITAN MISSILE FACILITY S-3
PRELIMINARY ASSESSMENT REPORT
ROYAL CITY, WASHINGTON**

1. INTRODUCTION

Ecology and Environment, Inc., (E & E) was tasked by the United States Environmental Protection Agency (EPA) to provide technical support for completion of a Preliminary Assessment (PA) at the Larson AFB Titan Missile Facility S-3 (Larson S-3) site near Royal City, Washington. E & E initiated PA activities under Technical Direction Document (TDD) Number 05-08-0010, issued under EPA, Region 10, Superfund Technical Assessment and Response Team (START)-2 Contract Number 68-S0-01-01, and completed PA activities under TDD Number 06-01-0023, issued under EPA, Region 10, START-3 Contract Number EP-S7-06-02.

The specific goals for the Larson S-3 PA, identified by the EPA, are:

- Determine the potential threat to public health or the environment posed by the site;
- Determine the potential for a release of hazardous constituents into the environment; and
- Determine the potential for placement of the site on the National Priorities List.

Completion of the PA included reviewing existing site information, collecting receptor information within the range of site influence, determining regional characteristics, and conducting a site visit. This document includes a discussion of background site information (Section 2), a discussion of migration/exposure pathways and potential receptors/targets (Section 3), summary and conclusions (Section 4), and a list of pertinent references (Section 5).

2. SITE BACKGROUND

2.1 SITE LOCATION

Site Name: Larson AFB Titan Missile Facility S-3
CERCLIS ID No.: WAN001002636
Location: Royal City, Washington
Latitude: 46° 54' 29"N
Longitude: 119° 45' 15"W
Legal Description: Section 1/Township 16N/Range 24E
Willamette Meridian
Congressional District: 4
Site Owner: (b) (6)
Site Operator: B & G Farms
12088 Road 11 Southwest
Royal City, Washington 99357
(509) 346-2294

2.2 SITE DESCRIPTION

The Larson S-3 site is located approximately five miles west of Royal City, Washington in Grant County (Figure 2-1). The site is a former Titan I intercontinental ballistic missile (ICBM) launch site. Former Department of Defense (DoD) structures that remain at the site include the missile silos and a concrete foundation. No other discernable DoD features remain, although, some DoD-era fuel storage tanks may still be present (Figure 2-2). Two wells installed by the DoD also are still present at the site; however, both are inactive. Currently, the site is leased by B & G Farms, a large farming operation. B & G Farms uses the site to store a variety of out-of-service and miscellaneous items generally relating to their agricultural operations.

Land surrounding the site is undeveloped or agricultural. These areas are relatively flat with land sloping gently toward the north and south. An intermittent ditch runs parallel to the west property line.

2.3 OWNERSHIP HISTORY

The property was acquired between 1959 and 1963 for the Department of the Air Force, Strategic Air Command, for a Titan ICBM launch site. A total of 313.74 acres were acquired as follows: 53.34 acres fee by negotiated purchase and 0.40 acres fee by condemnation in 1959 and 1960; 1.84 acres perpetual easement by negotiated purchase in 1960; 1.84 acres temporary easement and right-of-way, covering the same area as above, in 1960; one no-area license by donation in 1959; 255.53 acres perpetual restrictive easement by negotiated purchase in 1961-1962; 2.63 acres perpetual easements by negotiated purchase in 1963; and one no-area use permit by temporary transfer in 1962. (Harrell, not dated)

The facility was declared excess in 1966. The General Services Administration (GSA) subsequently conveyed the 53.34 acres fee, 1.84 acres perpetual easement, and the no-area license to (b) (6) by quitclaim deed executed on September 29, 1967. (b) (6) (b) (6). The GSA assumed custody and accountability for the 255.53 acres perpetual restrictive easement effective January 8, 1968. The 1.84 acres temporary easement and right-of-way terminated on November 3, 1961. GSA assumed custody and accountability for the 2.63 acres perpetual easement effective September 28, 1977. The no-area use permit was retransferred back to the owner effective December 16, 1974. (Harrell, not dated)

The Grant County Tax Assessors Office currently lists Bruce and Louise Moser as property owners of 53.20 acres of land formerly located within the site (GCTAO 2006).

2.4 SITE OPERATIONS AND WASTE CHARACTERISTICS

The site was used by the Air Force between 1962 and 1966 as a Titan I ICBM facility. Aboveground structures consisted of a gatehouse, entry portal, air intake and exhaust structures, sewage stabilization pond, spray pond, and security fencing. Subterranean construction consisted of a "hard" launch facility, with three missile launch complexes, each with three vertical missile silos, propellant and equipment terminals, two radar antenna silos, air intake and exhaust structures, control center, powerhouse, access portal, and an interconnecting steel tunnel system. Two deep wells, one 800 feet and

one 915 feet, supplied water to two 30,000 gallon underground water tanks which serviced the facility. (USACE 1992)

Various hazardous, flammable and/or explosive materials were used, stored, and disposed on-site during the period of operation of the facility. These included diesel oil, RP-1 fuel (kerosene), lubrication oil, hydraulic fluids, solvents, degreasers, sulfuric acid, transformer fluids which may have contained polychlorinated biphenyls (PCBs), nickel-cadmium batteries, liquid oxygen, nitrogen and helium. In most cases, these substances were held in tanks housed inside the facility or buried adjacent to it. (USACE 1992)

Storage capacities indicate the following volumes of selected substances were present routinely at the site: 40,000 gallons of RP-1; 134,000 gallons of diesel oil; 24,500 gallons of liquid gas; 78,000 gallons of liquid oxygen; 3,500 gallons of sulphuric acid; and nine clusters of high pressure tanks containing helium and nitrogen. (USACE 1992)

The Larson S-3 site was declared excess in 1966, and an accelerated program of salvage by private contractors under the direction of the Air Force followed. Salvage operations were extensive and evidently rapid. Generators, electrical equipment and supplies, motors, fixtures, and storage tanks were frequently removed in such operations. After the (b) (6) s purchased the property, they undertook further salvage efforts. (USACE 1992)

Contaminants may have been released to the on-site septic system. Diesel fuel and kerosene used in the silos and powerhouse were discharged to drain fields and ditch areas. Metals may exist at the site from impurities in fuel, machinery, lead-based paint, or waste oils. PCBs may be present in paints (used for durability), transformers, and hydraulic fluid releases. (Ecology 2000)

During the Air Force's salvage operations, the two water wells in the powerhouse were cut off at the floor level and left uncapped. Subsequent flooding of the facility has occurred allowing contamination to enter the groundwater through the uncapped wells which now serve as conduits from the powerhouse to the groundwater. Standing water with an oil sheen has been observed in parts of the facility. It is unclear whether all underground fuel storage tanks have been removed from the facility. (USACE 1992)

In 1975, the local irrigation district abandoned a nearby well due to high iron and bacteria content. Since it was thought that materials left in the missile facility might be the cause of the contamination, in 1984 the EPA emergency response program inspected the facility and took two composite samples from the standing water in the powerhouse. The analytical results revealed several heavy metals (cadmium, chromium, copper, lead, thallium, and zinc) and one volatile organic compound

(bis [2-ethyl hexyl] phthalate) in the water. One well was sampled. Results did not indicate the presence of contaminants. (Ecology 2000; USACE 1992)

2.5 PREVIOUS INVESTIGATIONS

This subsection describes previous investigations that have been conducted at the site.

2.5.1 United States Army Corps of Engineers - Seattle District PA - 1992

Since the site is a former military installation, it was identified for investigation under the Defense Environmental Restoration Program (DERP) by the United States Army Corps of Engineers (USACE). This program, which was formally established when the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was refined and expanded in 1986 by the Superfund Amendments and Reauthorization Act, requires that the USACE clean up properties that were at one time owned, leased, or operated by the DoD. Such properties are known as Formerly Used Defense Sites (FUDS).

In 1992, the USACE - Seattle District completed a PA of the site under DERP. Site visits were conducted on May 28, 1986 and June 5, 1991 as a part of this work. Overall, the condition of the facility was considered to be poor. Investigators could not determine whether or not underground storage tanks (USTs) remained. The investigation concluded that there was evidence of DoD-caused hazards. Based on this investigation, the USACE - Seattle District recommended additional work to further characterize the contamination at the site. Proposed work included sampling and analysis of the two groundwater wells, the standing water in the powerhouse, and the soils near the former spray pond and well houses. Also, it was recommended that a determination be made as to whether or not USTs remain at the site. (USACE 1992)

Although further work was recommended, it appears that none was conducted.

2.5.2 Washington State Department of Ecology Investigation - 2000 (Ecology 2000)

In 2000, the Washington State Department of Ecology (Ecology), Toxics Cleanup Program completed an investigation of the site to confirm or deny the presence of potential soil and groundwater contamination resulting from past DoD practices. The overall goal of the work was to determine whether or not there was the need for further investigation of the site.

On March 5, 1999, Ecology visited the site and collected four grab surface soil samples, two sediment samples, and two water samples. Surface soil samples were collected from 0 to 2 inches below

ground surface (bgs). Although not specified, it is likely that the sediment samples were also collected from 0 to 2 inches bgs.

Sample locations are not described in the investigation report. A map depicting sample locations is provided. From this map it is possible to determine which areas were sampled, but not what feature within the area was sampled. From this map, it appears that one surface soil sample each was collected in the following areas: Launcher 1, Launcher 2, the West Ditch, and the Antenna Silos. The sediment samples appear to have been collected near former USTs. The water samples were also collected in this area. The surface soil samples were analyzed for volatile organic compounds (EPA Method 8260). One sediment and one water sample were analyzed for total petroleum hydrocarbons as diesel (NWTPH-Dx). One surface soil sample was analyzed for PCBs (EPA Modified Methods 3545, 3620, and 8082). Finally, three samples (one surface soil, one sediment, and one water) were analyzed for metals (EPA SW-846 Method 6010).

Three surface soil samples contained detectable concentrations of methylene chloride. These samples were collected in the Launcher 1 area, the Launcher 2 area, and the West Ditch. Methylene chloride is a common laboratory contaminant. It is highly likely that this compound was introduced into the samples during laboratory analysis. Diesel and PCBs were not detected in the samples analyzed for these compounds. Low levels of metals were detected in the surface soil and sediment samples; however, the detected concentrations do not appear to be elevated. No metals were detected in the water sample. Based on these data, Ecology did not recommend further action at the site.

Photographs of the site were taken during this investigation. Although descriptions of the photographs could not be located, it is evident that the site at this time was being used to store large volumes of drums, tires in large piles, and other miscellaneous debris.

2.5.3 Ecology Investigation - 2005 (Ecology 2005)

From 1997 to the present, B & G Farms, the current site operator, has been under investigation by Ecology's Hazardous Waste and Toxics Reduction Program. Over the course of this time, this program has conducted several compliance inspections of this business' operations at the site; the most recent occurring in August and September 2004. Representatives from this program observed the site being used to store unknown and hazardous wastes in drums, waste oil and antifreeze in drums, approximately seven tons of spent oil filters, spent lead acid batteries, refrigerators with compressors, fluorescent light tubes, computer monitors, and more than 100 pesticide containers.

Over the course of time, some of these materials and containers have been removed from the site including the spent oil filters and three cargo trailers filled with drums and containers. These trailers were moved to a yard located near the company's Chemical Storage Building in Royal City, Washington. Ecology inspectors viewing the trailers in August, 2004 noted that one of the trailers was leaking material to the ground.

Also in August 2004, Ecology inspectors viewing the missile site observed plastic pesticide containers and drums on the northeast portion of the property and other 55-gallon drums and containers in other areas of the site. Some of the containers/drums were labeled as "Drexel Dynamyte II" or "Paraquat". Stained soil also was observed in several areas at the site, as were fluorescent light tubes, computer monitors, and lead acid batteries, at least one of which was burned.

Subsequently, in September 2004, Ecology returned to the site to conduct sampling of on-site soils. Two 4-part composite soil samples were collected from an area that formerly was used to store pesticide containers. One soil sample was collected from stained soil suspected to be the location of a spill of Drexel Dynamyte II. One soil sample was collected from a spill of a blue material. Two soil samples were collected from locations suspected to be oil spills. Finally, one soil sample was collected near the location of the burned lead-acid battery.

Analytical results of soils collected from the area of the Drexel Dynamyte II spill indicated the material should be classified as "Extremely Hazardous Waste" for disposal. Analytical results also indicated the presence of used oil in soils with visible oil discoloration, and lead and pesticides above Hazardous Waste and Model Toxics Control Act (MTCA) thresholds in soils near the burned battery.

As a result of these inspections and analytical results, B & G Farms' operations at the site were determined to be out of compliance with several dangerous waste and/or other environmental laws. B & G Farms was assessed a monetary fine and issued an Administrative Order requiring several specific actions to bring the site into compliance.

Ecology's Hazardous Waste and Toxics Reduction Program continues to monitor conditions at the site and to work with B & G Farms to bring the site into compliance with applicable environmental regulations. Ecology supplied results from the on-site drinking water well which was tested for herbicides in August, 2004, presumably by B & G Farms. These results do not indicate the presence of herbicides above State Safe Drinking Water Act standards. The well was not tested for other analytes.

2.6 START SITE VISIT

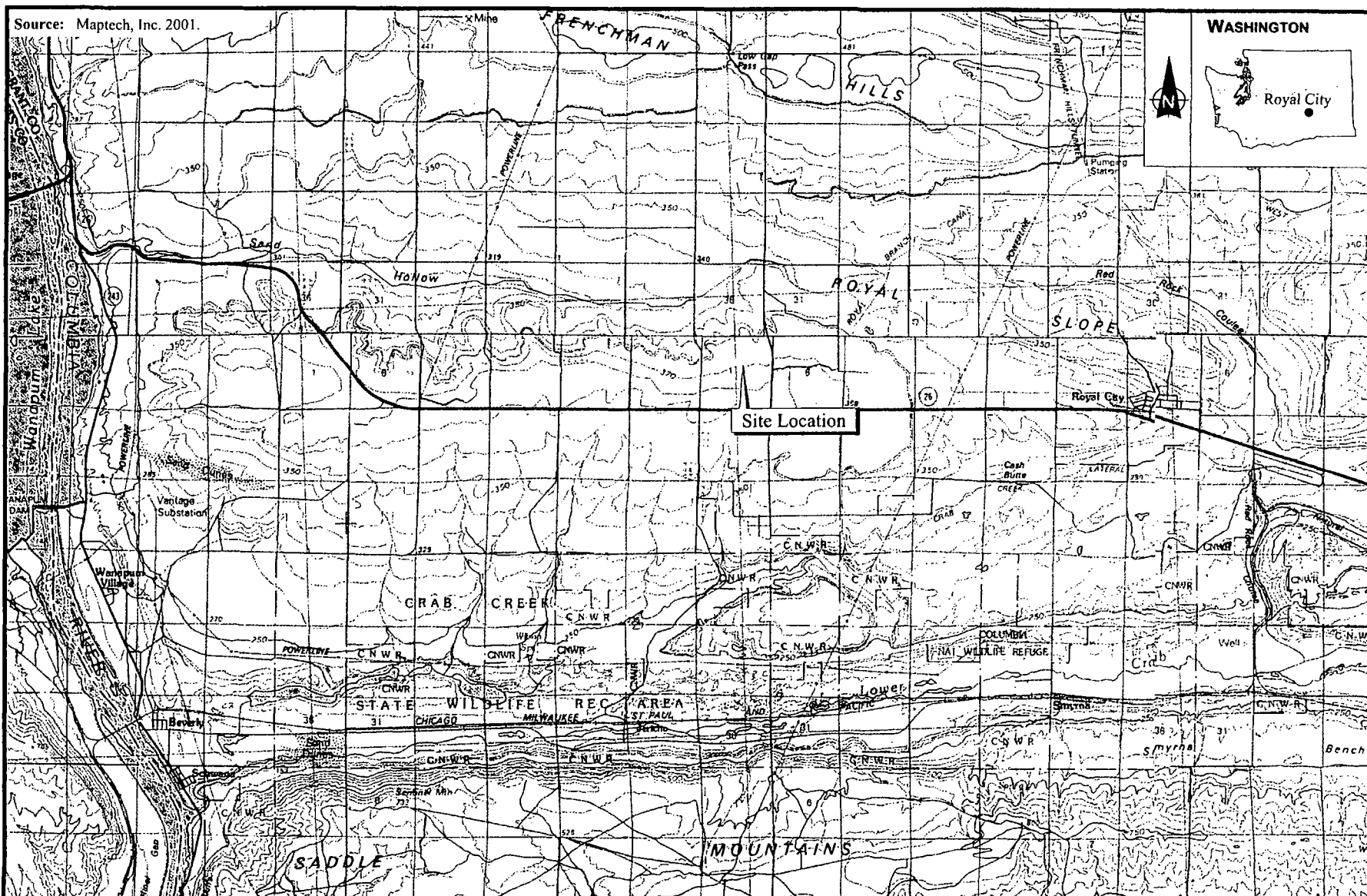
START conducted a drive-by site visit on February 15, 2006, followed the next day by an on-site property visit. The START was not accompanied by a site representative during the site visits. During these visits, the START took pictures of site features (Attachment A). The site is fenced around its entire perimeter and has a gated entrance that is left unlocked. The site is surrounded by open land. B & G Farms is using the property for storage over most of its area. Stored items include empty drums, piles of tires, farm equipment, heating oil tanks (some of which have been cut open), at least five 1,000-gallon tanks, approximately five 500-gallon tanks, wood pallets, scrap metal, construction equipment, and six or seven containers/trailers.

Additionally, three mobile homes/trailers are present at the site. One person is living in one of these trailers and is using the on-site well, drilled in 1982 by the current property owner, for drinking water. This is the same well that was previously sampled by Ecology.

The entrance to at least one of the missile silos was observed to be propped open. Standing water, approximately 100 feet deep, is present in the silos. Graffiti was observed in the silos and the silos are known to have been used by adventure sport divers.

In general, the site is in poor condition with a variety of out-of-service and unused items littered across it. The condition of the site appeared to be consistent with the condition of the site described by Ecology 2004. No stained soil was observed.

Source: Maptech, Inc. 2001.



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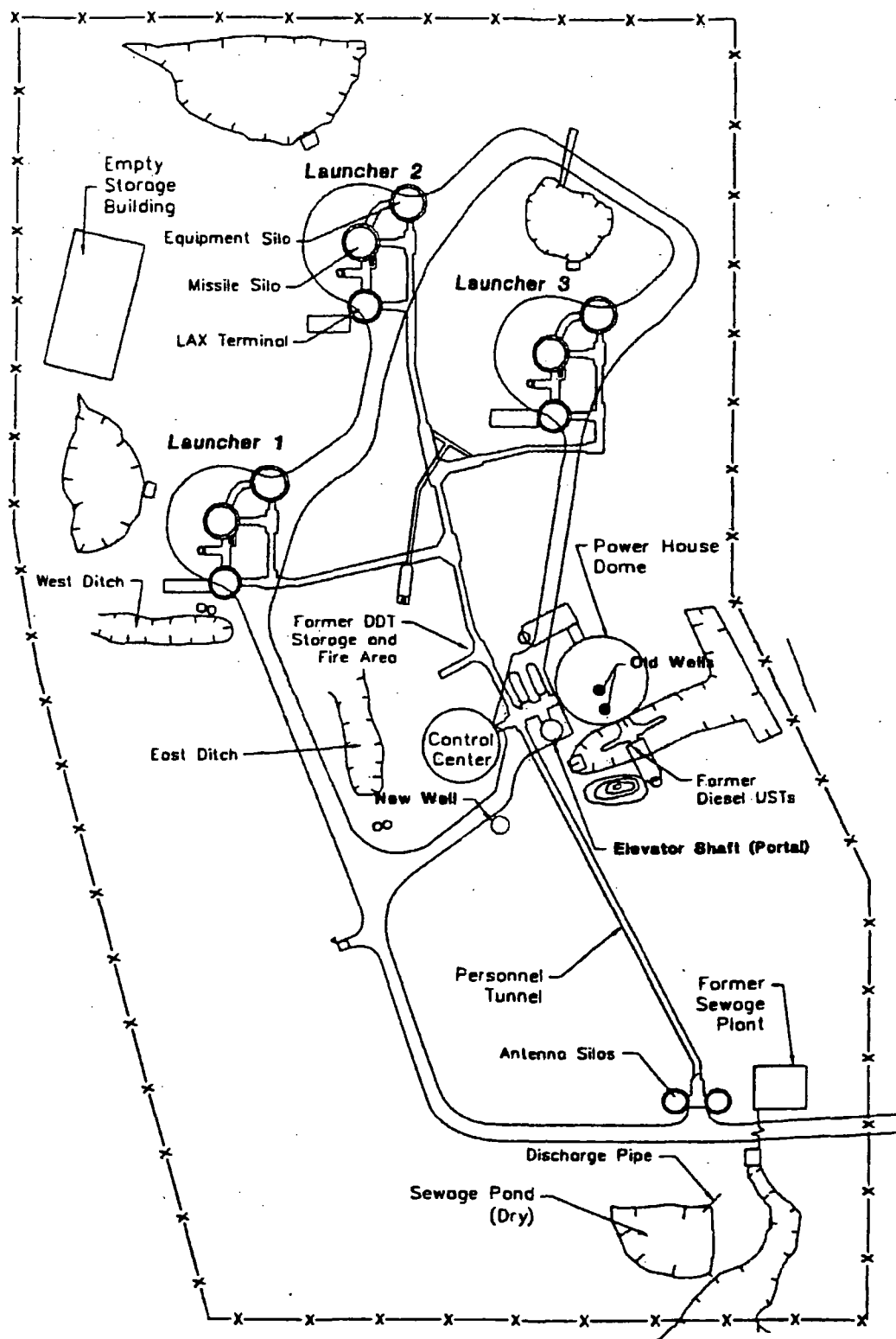
0 1 2
Approximate Scale in Miles

Figure 2-1
SITE LOCATION MAP

Date:
2/7/06

Drawn by:
AES

10:START-3\060100230\fig 2-1



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Royal City, Washington

Figure 2-2
SITE MAP

Not to Scale

Date:
1-31-06

Drawn by:
AES

10:START-3\060100230\fig 2-2

3. MIGRATION/EXPOSURE PATHWAYS AND TARGETS

The following sections describe migration/exposure pathways and potential targets within the site's range of influence (Figures 3-1 and 3-2).

3.1 GROUNDWATER MIGRATION PATHWAY

The target distance limit (TDL) for the groundwater migration pathway is a 4-mile radius that extends from the sources at the site. Figure 3-1 depicts the groundwater 4-mile TDL. The site is located in a geologic area known as the Royal Slope. The Tertiary, Miocene Yakima Basalt of the Columbia River Group is a thick sequence of basalt flows which underlie the area of the site. Generally, the basalt is quite permeable and, under favorable conditions, is capable of yielding large quantities of water to wells. Water occurs mostly in the tabular zone along the tops and bottoms of individual flows. The flow tops generally are permeable because of their highly jointed nature, the presence of cinders and rubble, and the existence of vesicular cavities connected by joints and cracks. The lower parts of the flows are permeable where irregular openings are present, or in places where lava deposited in water forms a characteristic pillowlike broken zone. Many of these pillow zones are continuous over large areas and are very permeable. The thickness of individual basalt flows range from 20 to 100 feet in the area of the site. (Tanaka 1974)

Lying above the Yakima Basalt are unconsolidated sedimentary deposits consisting of stratified clay, silt, sand, and gravel. The material includes the Quarternary, Pleistocene Ringold Formation which is present in the area of the site. The Ringold Formation comprises three principal lithofacies in the general area of the site. These are sand and silt, laminated clay and silt, and conglomerate. The sand and silt facies, believed to be mainly eolian in origin, are widespread in the area of the site and are usually interbedded with the other Ringold facies. The clay and silt facies, lacustrine in origin, comprise most of the material overlying the Yakima Basalt beneath the Royal Slope. Although the permeability of the clay and silt is low, sand strata in the lacustrine facies may yield small quantities of water to wells. The conglomerate facies does not occur at the site. (Tanaka 1974)

Two principal aquifer systems are present: the Yakima Basalt aquifer, herein referred to as the lower aquifer, and the unconsolidated deposits overlying it, herein referred to as the upper aquifer. The

basalt is consolidated and the water it contains is mainly under pressure or artesian conditions. The Ringold Formation overlying the basalt are unconsolidated to semi-consolidated and the water it contains is mainly at atmospheric pressure and under water-table conditions. (Tanaka 1974)

The depth to each aquifer could not be determined from the available information; however, three wells have been drilled at the site: two by the USACE and one by the current property owner. The most shallow well was drilled to a depth of 62 feet bgs. Since the water in this well is under artesian conditions with a static water level of 16 feet bgs; and since basalt was present from 23 to 62 feet bgs, it appears the well accesses water from the lower aquifer. Lithology was described as caliche, or hardpan, from 2 to 23 feet bgs, indicating an aquifer in this zone was not present. The depth to water is not indicated on the well log. (WSDWR, various dates)

The nearest domestic well is located on-site. The well is used by one on-site resident for drinking water. Further, approximately 51 domestic wells are present within the 4-mile TDL (WSDWR, various dates). The number of people served by these wells has been estimated by multiplying the number of wells by the average number of persons per household for Grant County of 2.92 people (USDOC 2000). Using this method, it is estimated that approximately 149 people receive drinking water from these domestic wells. Groundwater is known to be used for irrigation of greater than 5 acres of commercial food crops (WSDWR, various dates). The site is not in a wellhead protection area. Table 3-1 provides the groundwater drinking water populations served by distance ring.

3.2 SURFACE WATER MIGRATION PATHWAY

The surface water migration pathway TDL begins at the probable point of entry (PPE) of surface water runoff from the site to a surface water body and extends downstream for 15 miles. Figure 3-2 depicts the surface water 15-mile TDL. The site is located in a relatively flat area at an elevation of 1,210 feet above mean sea level. The site slopes gently to both the north and south. There are no distinct surface water overland routes leading directly through the site to surface water. An intermittent ditch is located adjacent to the west boundary of the site, and may receive some surface water. Most surface water runoff can be expected to infiltrate the ground. The upland drainage area at the site is expected to include only the site itself, or 53.20 acres.

Two PPEs to the surface water exist for the site. The first is located to the west in an unnamed intermittent ditch which flows south approximately 0.4 mile to an unnamed intermittent canal. This canal flows west approximately 13 miles to the Columbia River. The 15-mile TDL for this PPE ends 1.6 miles downstream in the Columbia River. A second PPE is located approximately 0.25 mile to the north

of the site on an unnamed intermittent stream used for irrigation. This stream ends approximately 10.5 miles downstream of the site. The stream flow rates of the unnamed ditch, the unnamed canal, and the unnamed stream are not known. The START estimates the flow rate of the unnamed ditch to be less than 1 cubic foot per second (cfs) and that of the unnamed canal and unnamed stream to be between 1 and 10 cfs. The average annual flow rate of the Columbia River for 2003 was 100,900 cfs as measured at Priest Rapids Dam located approximately 16 miles downstream of the point that the unnamed canal enters the Columbia River (USGS 2003a). Several tributaries enter the river between the canal's point of entry and Priest Rapids Dam, including Lower Crab Creek which had an average annual flow rate of 196 cfs in 2003 (USGS 2003b). In total, these tributaries and Lower Crab Creek are estimated to contribute 300 cfs to the flow of the Columbia River between the canal's point of entry and Priest Rapids Dam, therefore, the flow rate of the Columbia River at the point of the canal's entry is estimated to be 100,600 cfs (i.e., 100,900 cfs - 300 cfs).

Surficial soils at the site are primarily classified as Kennewick fine sandy loam. This is deep, well drained soil formed in lacustrine deposits. Typically, the surface layer is very pale brown fine sandy loam 9 inches thick. The substratum to a depth of 60 inches or more is very pale brown silt loam that includes fine layers of silt. Permeability of this soil is moderately slow. Runoff is slow and the hazard of water erosion is slight (USDA 1984). The site soils are presumed to be moderately fine textured with low infiltration rates.

The average annual rainfall for Othello, Washington which is located approximately 28 miles east of the site, is 8.18 inches (WRCC 2005). The 2-year, 24-hour rainfall event is approximately 1.0 inch (NOAA 1973). The site is not located in a floodplain (FEMA 1988).

No drinking water intakes exist within the 15-mile TDL. Surface water bodies within the 15-mile TDL primarily consist of intermittent canals and streams primarily used for irrigation. The Columbia River, located within the 15-mile TDL, is used extensively for recreational boating.

Fishing is not expected to occur on the unnamed stream or the unnamed canal since these are intermittent surface water bodies. Fishing is known to occur throughout the Columbia River. A variety of fish species are caught from the mid-Columbia River area including steelhead, Chinook salmon, white sturgeon, and smelt. The START estimates that 150 pounds of fish were harvested from the Columbia River within the site's 15-mile TDL.

No Federal- or State-listed endangered and threatened species occur within the 15-mile TDL (WSDFW 2006). Approximately 0.19 mile of wetland frontage exists within the 15-mile TDL; 0.04 mile are present along the banks of the unnamed stream to the north of the site, and 0.15 mile are present

along the banks of the unnamed canal to the south of the site (USFWS 1988a, USFWS 1988b; USFWS 1988c; USFWS 1988d; USFWS 1988e; USFWS 1988f).

3.3 SOIL EXPOSURE PATHWAY

The soil exposure pathway is evaluated based on the threat to resident and nearby populations from soil contamination within the first two feet of the surface. START observed no visible areas of soil contamination during the Larson S-3 site visits. No schools or day care facilities are currently located within 200 feet of the site. One person lives at the site and approximately 55 people live within a 1-mile travel distance of the site. Table 3-2 provides population data.

The Larson S-3 site is fenced around its entire perimeter and has an unlocked gate. No terrestrial-sensitive environments are located on site. No resource use occurs at the site (i.e., commercial agriculture, commercial silviculture, commercial livestock production or commercial livestock grazing).

Surface soil samples collected on site by Ecology in 1999 did not reveal on-site contamination; however, this sampling event was limited in its scope of sampling and analysis.

3.4 AIR MIGRATION PATHWAY

The air migration pathway TDL is a 4-mile radius that extends from the sources at the site (Figure 3-2). One person resides on-site. Further, approximately 477 people reside within the 4-mile TDL. Table 3-2 provides population information within the 4-mile TDL.

The ferruginous hawk (*buteo regalis*), a Federal candidate species and State-listed threatened species, occurs between 3 and 4 miles of the site (WSDFW 2006). Approximately 686.4 acres of wetlands occur within the 4-mile TDL (USFWS 1988a, USFWS 1988b; USFWS 1988c; USFWS 1988d; USFWS 1988e; USFWS 1988f). Commercial agriculture occurs within 0.5 mile of the site. Table 3-2 provides estimated wetland acreage within a 4-mile radius of the site.

Table 3-1 GROUNDWATER DRINKING WATER POPULATION WITHIN A 4-MILE RADIUS LARSON AFB TITAN MISSILE FACILITY S-3 PRELIMINARY ASSESSMENT ROYAL CITY, WASHINGTON		
Distance (Miles)	Wells	Population
0-¼	1	1
¼-½	0	0
½-1	3	8.76
1-2	11	32.12
2-3	14	40.88
3-4	23	67.16
Total	52	149.92

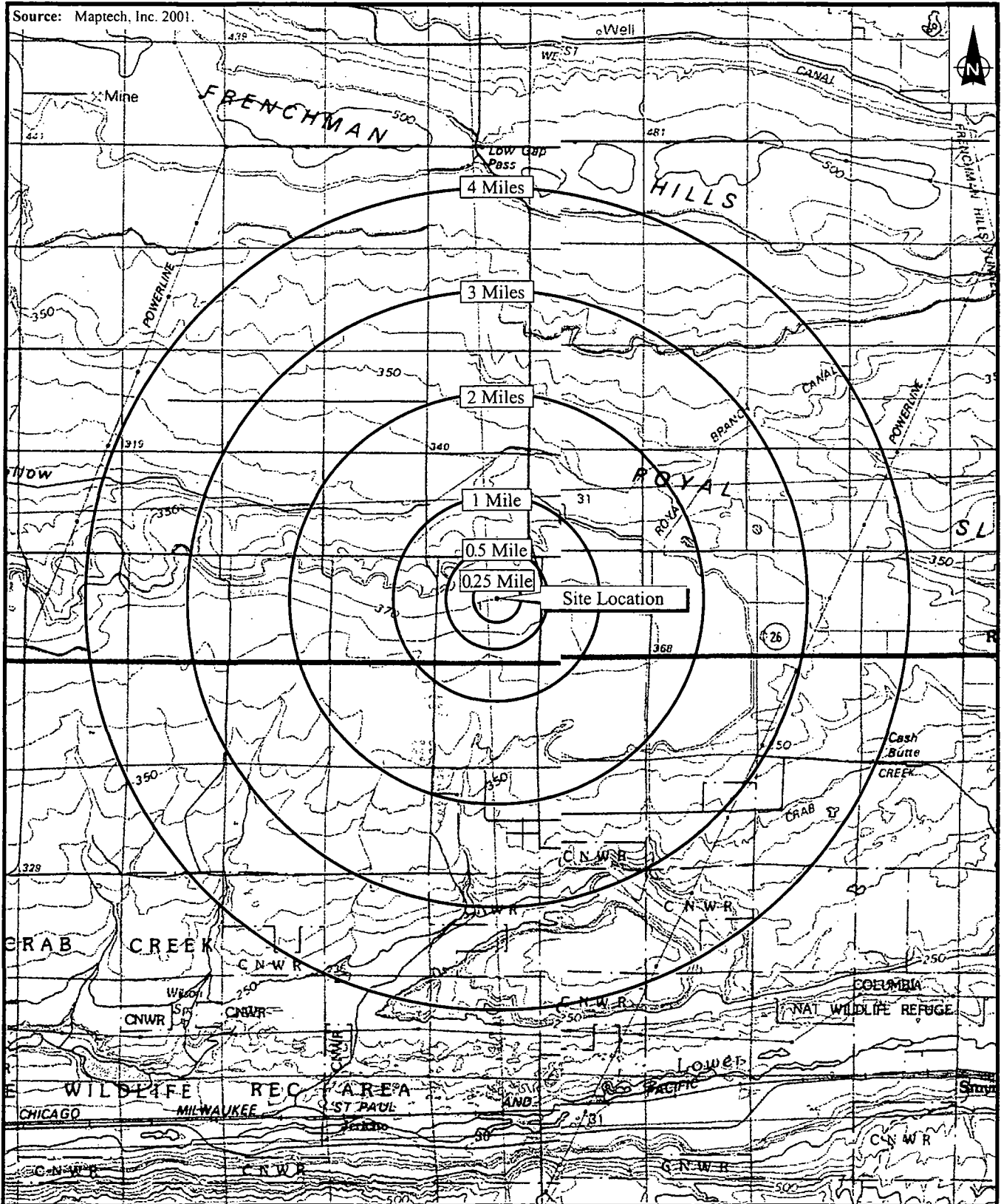
Source: WSDWR various dates; USDOC 2000.

Note: The well populations was based on the average number of person per household for Grant County of 2.92 people.

Table 3-2 POPULATION AND WETLANDS WITHIN A 4-MILE RADIUS LARSON AFB TITAN MISSILE FACILITY S-3 PRELIMINARY ASSESSMENT ROYAL CITY, WASHINGTON		
Distance Ring (Miles)	Population	Wetlands (Acreage)
On site	1	0
0-¼	1	0
¼-½	5.8	2.7
½-1	48.3	23.7
1-2	104	48.1
2-3	141.3	247.2
3-4	176.6	364.7
Total	478	686.4

Source: USDOC 2000; USFWS 1988a; USFWS 1988b; USFWS 1988c; USFWS 1988d; USFWS 1988e; USFWS 1988f.

Source: Maptech, Inc. 2001.



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0 0.5 1
Approximate Scale in Miles

Figure 3-1

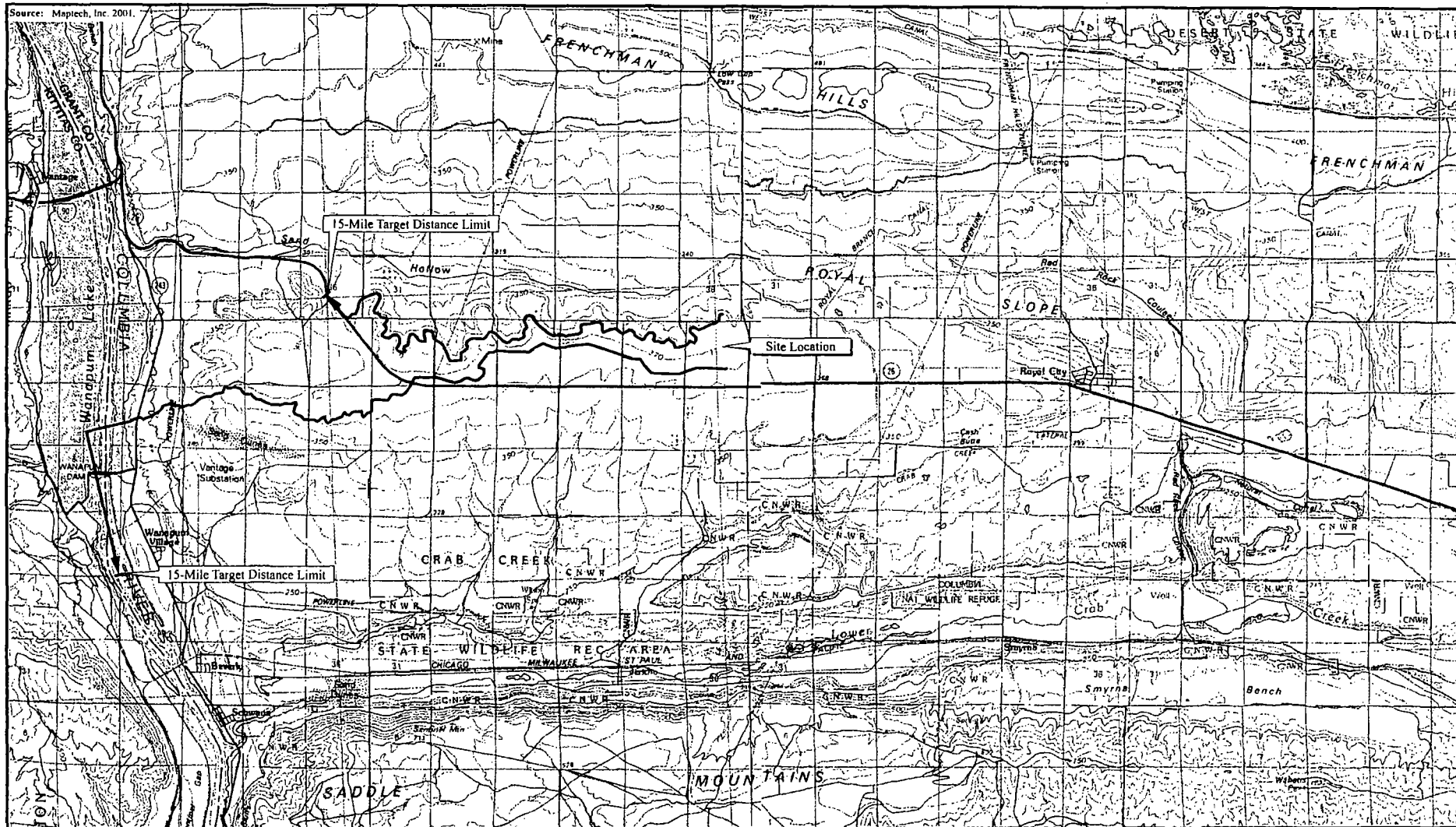
4-MILE MAP

Date:
2-3-06

Drawn by:
AES

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ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington



0 0.75 1.5
Approximate Scale in Miles

LARSON AFB
TITAN MISSILE FACILITY S-3
Royal City, Washington

Figure 3-2
15-MILE MAP

Date:
2/3/06

Drawn by:
AES

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4. SUMMARY

The START conducted site visits on February 15 and 16, 2006. The START observed on-site features and photographed the site. This section summarizes site findings based on the site visit and a review of site-related documents; and discusses site conclusions.

4.1 SUMMARY

The Larson S-3 site is a former DoD titan ICBM launch facility that currently is being used by B & G Farms to store a variety of out-of-service items. The site is located approximately five miles west of Royal City, Washington. DoD features that remain at the site include missile silos and one concrete foundation. Two abandoned DoD installed wells and one newer in-use domestic well also are present at the site. One person is living in a trailer at the site. This person is using the on-site well for drinking water purposes. Sampling of this well in 2004, did not detect the presence of herbicides at concentrations that exceeded Washington State Safe Drinking Water Act standards.

Previous sampling and analysis of the site conducted by Ecology's Toxics Cleanup Program in 1999, did not reveal the presence of contamination at sampled former DoD features which included Launcher 1, Launcher 2, the West Ditch, the Antenna Silos, and possibly former USTs.

The current property operators, B & G Farms, are under investigation by Ecology's Hazardous Waste and Toxics Reduction Program. This program has issued an Administrative order to B & G Farms to address site conditions, contamination that has resulted from their activities, and to bring the site into environmental compliance.

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5. REFERENCE LIST

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ATTACHMENT A
PHOTOGRAPHIC DOCUMENTATION



Photo 1 Concrete Tubes (vents?).
Direction: West Date: 2/15/06



Photo 2 Drums outside warehouse.
Direction: Southwest Date: 2/15/06



Photo 3 Tanks.
Direction: West Date: 2/15/06



Photo 4 Debris on north end of property.
Direction: West Date: 2/15/06



Photo 5 Open silos doors.
Direction: West

Date: 2/15/06



Photo 6 More tanks with label "Soil & Crop Service, Inc."
Direction: Northwest

Date: 2/15/06



Photo 7 Concrete foundation and debris.
Direction: West

Date: 2/15/06



Photo 8 Piles of tires.
Direction: Southwest

Date: 2/15/06



Photo 9 Tires and concrete foundation.
Direction: Southwest Date: 2/15/06



Photo 10 Tires and miscellaneous debris.
Direction: West Date: 2/15/06



Photo 11 Tanks and in the background on the right side of the frame;
 farm equipment.
Direction: Northwest Date: 2/15/06

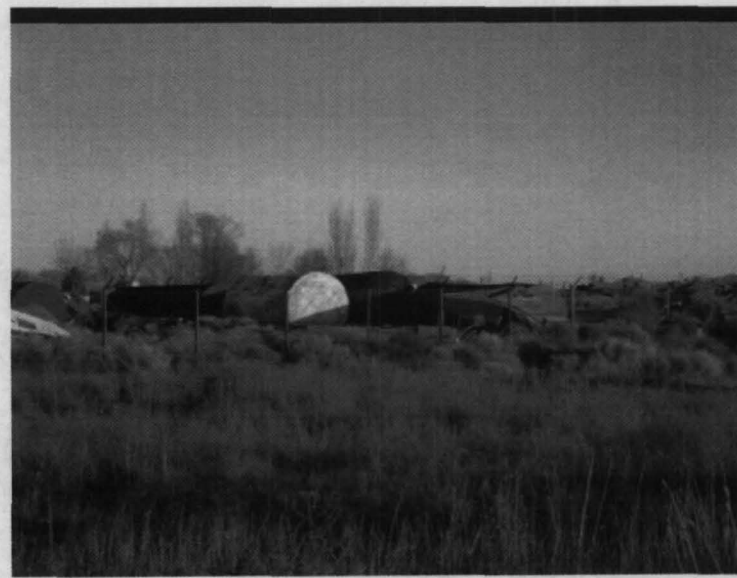


Photo 12 Storage tanks.
Direction: Northeast Date: 2/15/06



Photo 13 Trailer which may be a potential residence.
Direction: West *Date: 2/15/06*



Photo 14 Evidence of habitation at the property.
Direction: West *Date: 2/15/06*



Photo 15 Storage building.
Direction: North *Date: 2/16/06*



Photo 16 Inside of silo with graffiti.
Direction: Down *Date: 2/16/06*



Photo 17 Entrance door to silo propped open.
Direction: Northwest *Date: 2/16/06*

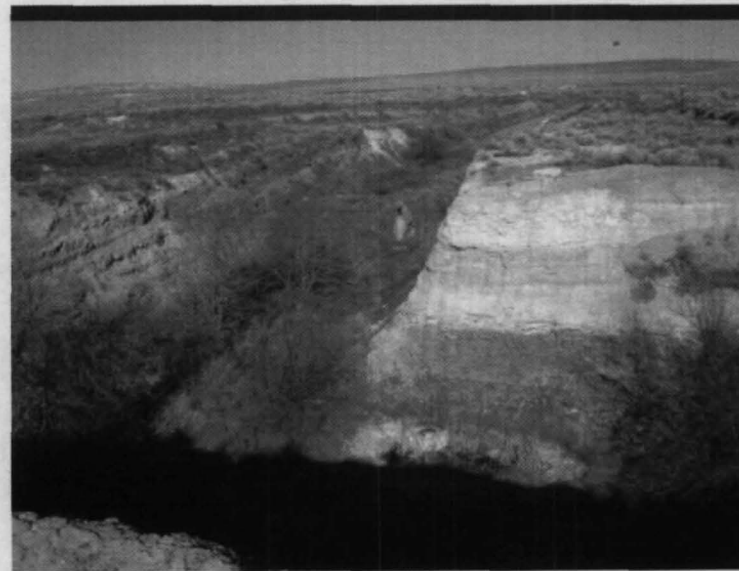


Photo 18 Irrigation ditch on west side of property.
Direction: North *Date: 2/16/06*



Photo 19 Irrigation ditch and tire pile.
Direction: East *Date: 2/16/06*



Photo 20 Irrigation ditch and tire pile.
Direction: East *Date: 2/16/06*
